return Herb Bowman

September 4, 1969

H. E Bowman

RECOMMENDATIONS RELATING TO STORAGE OF PLUTONIUM RESIDUES, SOLID RADIOACTIVE WASTES AND CONTAMINATED EQUIPMENT

For the purpose of discussion, three subject categories are defined below

<u>Plutonium Residues</u> Material with recoverable quantities of plutonium stored in drums and destined for future processing to remove the plutonium

<u>Solid Radioactive Wastes</u> Any contaminated material or equipment appropriately packaged in drums or boxes and released to Waste Disposal Coordination for disposal at Arco, Idaho

<u>Contaminated Equipment</u> Any item or items of contaminated equipment packaged and stored for possible future use

Plutonium Residues

As a result of H E Bowman's letter of July 16, 1969 to L.F Grill, two separate authorizations (Parts II and III) were drafted by G F Molen The first was for a sheltered area for Building 776 fire residues and the second for an additional area, paved only, for other existing residues

As a short-term solution to the immediate problem, it would be possible on a paved surface to use pallets and tarpaulins This would not result in complete protection from the weather

REVIEWED FOR CLASSIFICATION
By R B Hoffman
Date 7/11/90

REVIEWED FOR CLASSIFICATION/UCNI
By
Date 7/13/90

ADMIN RECORD

A-OU02-000002

but would be a considerable improvement over the present method especially if the drums were located within the Building 771 security fence A more ideal situation, both politically and for contamination control reasons, would be complete shelter This, of course, will require considerably more money This is evidenced by the authorization drafts attached

While being somewhat of a compromise between pallets and tarps as compared to a warehouse-type building, there is considerable merit in leasing or purchasing commercial cargo crates These, I believe, represent both a short-range and a long-range solution These crates are available in 20- or 40-ft length with 8x8-ft nominal cross-section A 20-ft crate, such as is used for waste shipment, holds 66 fifty-five gallon drums (two layers of 33) Crates can be rented at about $500 or purchased for about $2500 A freight cost of $375 each would be added either way It would appear that sufficient crates could be purchased and delivered for about $250,000 I believe this to be a factor of 5 to 10 below what it would cost to construct a building to do the same job

Cargo crates as advertised are available in either steel or cast aluminum With a tare weight of only 4,145 lb for a steel crate and less for aluminum, the crates can be transported with relative ease When filled with drums, a crate would be stable in high winds Except for two small weather-proof vents, which could be stopped up if desired, a crate would offer absolute containment Prior to opening, a "Sniffer"-type air sampler could be used at one of the air vents to give an indication of any release within the crate

With some small exception, no criticality potential would occur with 66 drums in a crate It is possible that a lower limit on residues for such material as incinerator ash would take care of this, or it would still be practical and economical to store a single layer which would definitely be critically safe

In reviewing fire detection requirements with Ken Hess, it was concluded that if crates were purchased so minor modifications could be made and located north of Building 770, it would be practical to install Fenwall detectifiers at each crate and tie in to an already planned system at Building 770 at an additional cost of $5 to $10 thousand It would also be possible to equip the crates with bulkhead fittings for introduction of CO_2 or foam

The alternative for complete shelter would be a large warehouse-type building As can be concluded from the preliminary estimates for fire residues only, cost of such a structure for all residues would be in the million-dollar range Such a structure would require power for lighting and alarm systems From the contamination spread standpoint, the building should not be ventilated. Experience dictates that should an incident occur, less contamination spread occurs under static conditions The building should be tight, however, and vented through absolute filters

Continuous air monitors with remote readout should be installed according to an appropriate grid layout These devices will give an alarm for a fairly major release A small local release would probably not be detected by this means Routine operational monitoring would be expected to detect any small releases

A "products of combustion" detection system should also be installed Criticality detectors would be required in areas where high-level residues are stored From the preliminary work done on the authorization, it appears that a sprinkler system may be required and if this is the case, I expect some type of heating would also be required

All things considered I would recommend consideration be given to cargo crate storage on a black-top surface located north of Building 770 and enclosed within the security fence

Solid Radioactive Wastes

While some backlog continues to exist and the fire wastes so far have been voluminous, we expect to reach a point within a reasonable period of time such that waste will remain on the site for only a matter of weeks No storage shelters are recommended for that reason We will, in a sense, have some limited storage capability for non-conforming waste in cargo crates as they are fitted and await shipment.

Contaminated Equipment

There are a number of items of contaminated equipment contained in wooden boxes and stored outside While such items have not presented a hazard in the past, the boxes do deteriorate and with extended storage could be a source of contamination spread According to Jack Tomlinson, a building of several thousand feet would be adequate for the present property under his jurisdiction While it is possible that codes or regulations may require certain services, the probability for a serious contamination hazard from such storage would be remote and I would <u>not</u> recommend a need for alarm systems such as might be required for residue storage in such a building It would probably bly be practical and more economical to consider rental or purchase of cargo crates for storage of such equipment

E A Putzier
Health Physics

EAP ab
Enc

cc,
C M Love

AUTHORIZATION - PART II

SCOPE AND JOB DESCRIPTION

Auth No _____

Date _____

1 Subject Barrel Storage Area, Building 770 East

2 Scope

Provide an additional paved barrel storage area for various classes of wastes awaiting processing in Building 771

3. Job Description

An area of approximately 36,600 square feet northeast of Building 770 and immediately east of the authorization for a covered storage area would be filled and compacted This would entail relocation of the security fence and lights along the fence In addition, suitable drainage would be provided by grading this area in a two-terrace design Upon completion of the compaction, this area will be paved

8/20/69

Approved Date

Operating Board Member Date

AUTHORIZATION - PART III

JUSTIFICATION

Auth No _____

Date July 30, 1969

1 Subject: Barrel Storage Area, Building 770 East

2 Justification:

Presently, all barrels of Building 776 fire waste must be counted for radioactivity in Building 771 prior to shipment These barrels are stacked in the paved area north of Building 771 prior to counting and after counting while the results are pending This means that any barrel is held a minimum of three days The storage area presently being used is a driveway for vehicles serving Buildings 771 and 774 docks The area is also a designated assembly area in time of a gamma alert

Presently, all waste boxes from the Building 776 fire area are being stored in the field east of the waste evaporation ponds This same area is also used for storage of barrels prior to processing in Building 771 The barrel storage portion of the area must be abandoned to make room for additional waste boxes being removed from the fire area. The proposed area east of Building 770 would also be used to store barrels prior to processing in Building 771

8/26/69

Approved Date

Operating Board Member Date

ITEM III

FILL, COMPACTION & DRAINAGE OF THE AREA EAST OF THE PAVED AREA DESCRIBED IN ITEM I. THIS ITEM TO INCLUDE NEW SECURITY FENCING & SECURITY LIGHTS ALONG THE FENCE

COST ESTIMATE ITEM III

1) FILL & COMPACTION (THIS ESTIMATE IS BASED ON A TWO TERRACE DESIGN)

$425\ yd^2 \times \$2.75/yd^2 = \$1,500$ — $1,500

2) PAVING:

$\frac{30,000\ ft^2}{9\ ft^2/yd^2} \times \$5/yd^2 = \$20,000$ — $20,000

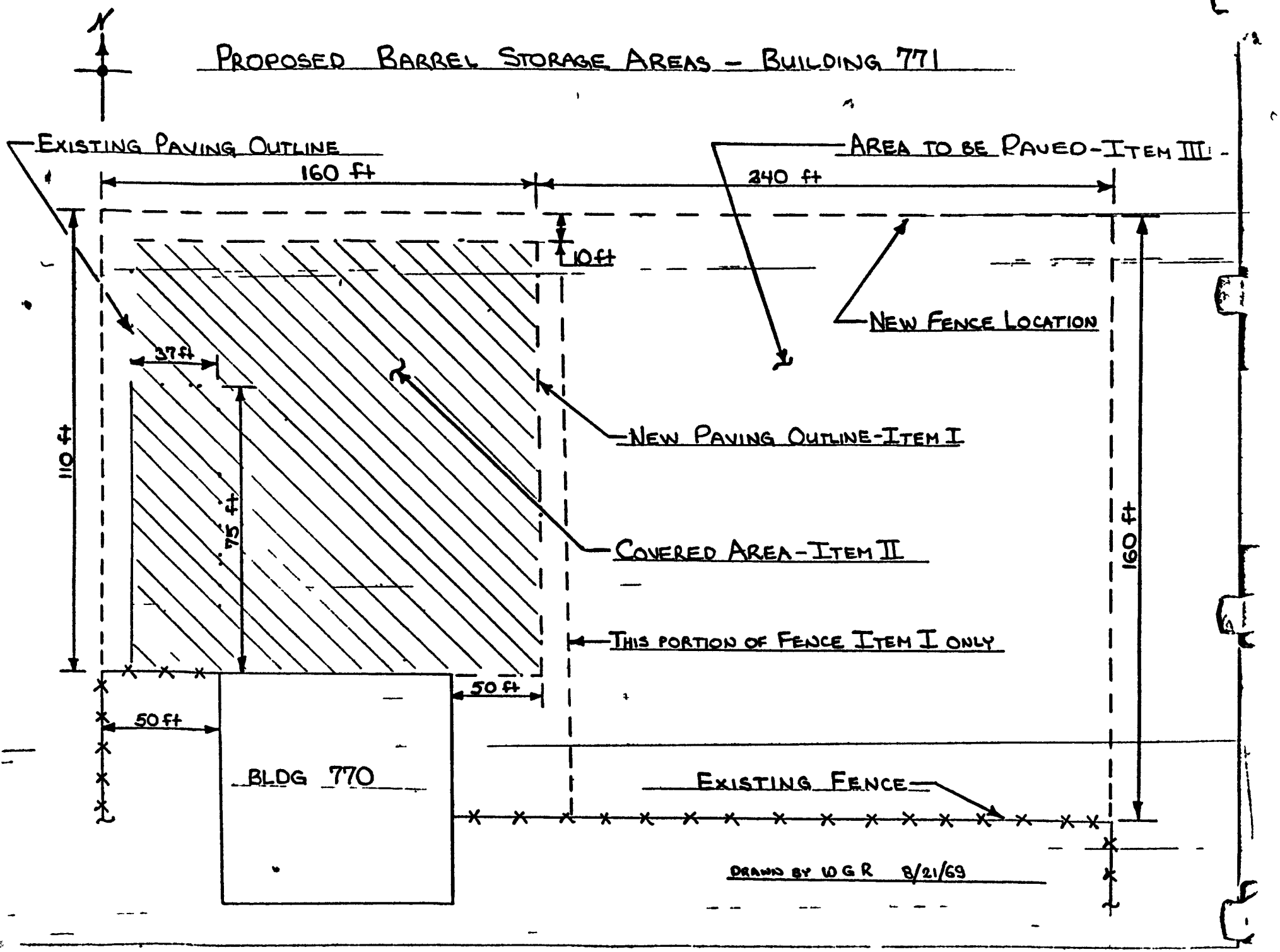
3) FENCING:

400 ft TO INSTALL @ $3.00/ft = $1,200
400 ft TO PURCHASE @ $2.00/ft = 800
$2,000 — 2,000

4) ERECTION OF SECURITY FENCE LIGHTS

400 ft @ $2.00/ft = $800 — 800

TOTAL CONST COST	$23,300
15% CONTINGENCY	3,500
15% ENGINEERING	3,500
TOTAL ESTIMATED COST	$30,300
CONTRACTORS OVERHEAD, PROFIT, & BONDING	6,200
GRAND TOTAL ESTIMATED COST	$36,500


N
PROPOSED BARREL STORAGE AREAS – BUILDING 771
EXISTING PAVING OUTLINE
AREA TO BE PAVED-ITEM III
160 ft
240 ft
10 ft
NEW FENCE LOCATION
37 ft
NEW PAVING OUTLINE-ITEM I
110 ft
75 ft
COVERED AREA-ITEM II
160 ft
THIS PORTION OF FENCE ITEM I ONLY
50 ft
50 ft
BLDG 770
EXISTING FENCE
DRAWN BY W G R 8/21/69

AUTHORIZATION - PART II

SCOPE AND JOB DESCRIPTION

Auth No _____

Date July 30, 1969

1 Subject Covered Storage Area, Building 770 North

2. Scope

Provide a covered storage area, adjacent to Building 771, for barrels from the 776 fire

3 Job Description

Locate an asphalt paved area of approximately 12,300 square feet immediately north of Building 770 The existing security fence running east and west along the north side of Building 770 would be relocated to encompass the paved area, with a 10 foot strip of unpaved area maintained between the fence and the paving The proposed area would require some fill and compaction prior to paving This paved area would then be covered with a roof structure of minimum design to accommodate wind and snow loading conditions Walls will be provided on the north and west sides of this structure. Minimum lighting will also be provided in the structure

8/20/69

Approved Date

Operating Board Member Date

AUTHORIZATION - PART III

JUSTIFICATION

Auth No _____

Date July 30, 1969

1 Subject: Covered Storage Area, Building 770 North

2 Justification:

Fire wastes awaiting processing in Building 771 will be stored in this storage area

Please reference the attached letter from H E Bowman to L F. Grill, dated June 16, 1969 This submittal is in answer to that letter

8/20/69

Approved Date

Operating Board Member Date

RF-21583

THE DOW CHEMICAL COMPANY

ROCKY FLATS DIVISION
P O BOX 888
GOLDEN, COLORADO 80401

June 16, 1969

L F Grill

STORAGE OF FIRE RESIDUES FOR RECOVERY

It probably is too early to get a real good fix on what quantity of drums, boxes, etc , containing fire residues will have to be stored, awaiting recovery However, we do not want another "oil field" problem to contend with Therefore, I suggest that as soon as you can estimate how many drums will have to be added to storage, you get with Facilities Planning and see if you can find some adequate storage facilities I'm thinking of two possibilities; there are quite probably others

1 Some structures left over from Construction

2 Building something using recovery funds This need be nothing more than "duck boards" to keep them off the ground and a roof to keep water and direct sun away

H E Bowman
Manufacturing Manager

HEB/mh

cc:
D M Bassler
L. M Joshel
E. A. Putzier

PROPOSED BARREL STORAGE AREAS
BUILDING 771

ITEM I

PAVING OF AN AREA OF APPROXIMATELY 100 ft x 150 ft IMMEDIATELY NORTH OF BLDG 770. THIS PROPOSED INSTALLATION WILL REQUIRE SOME FILL & COMPACTION PRIOR TO PAVING & RELOCATION OF THE SECURITY FENCE

COST ESTIMATE ITEM I

1) PAVING:

$$\frac{11580\ ft^2}{9\ ft^2/yd^2} \times \$5/yd^2 = \$6,425 \qquad \$6,425$$

2) FILL & COMPACTION:

$$\frac{31000\ ft^3}{27\ ft^3/yd^3} \times \$2/yd^3 = \$2,325 \qquad \$2,325$$

3) FENCING

100 ft TO REMOVE @ $1.50/ft	$ 150	
385 ft TO INSTALL @ $3.00/ft	1,155	
285 ft TO PURCHASE @ $2.00/ft	570	
	$1,875	1,875

TOTAL CONST COST	$10,625
15% CONTINGENCY	1,600
15% ENGINEERING	1,835
TOTAL ESTIMATED COST	$14,060
CONTRACTORS OVERHEAD, PROFIT, & BONDING	3,140
GRAND TOTAL ESTIMATED COST	$17,200

ITEM II

COVERING OF THE PAVED AREA DESCRIBED IN ITEM I. MINIMUM CONSTRUCTION TO MEET WIND & SNOW LOADINGS WALLS ON THE NORTH & WEST SIDES.

COST ESTIMATE ITEM II

1) BUILDING[A]:

15,000 ft² × $20/ft² = $300,000 ≈ $300,000

[A] INCLUDES - WALLS, ROOF, SUPPORTS, ENGINEERING, CONTRACTORS PROFIT & BONDING, & H.P. AIR MONITORS

2) ELECTRICAL[B]:

15,000 ft² × $2.20/ft² = 33,000 ≈ 33,000

[B] INCLUDES - LIGHTS, MINIMUM OUTLETS, ALARMS &

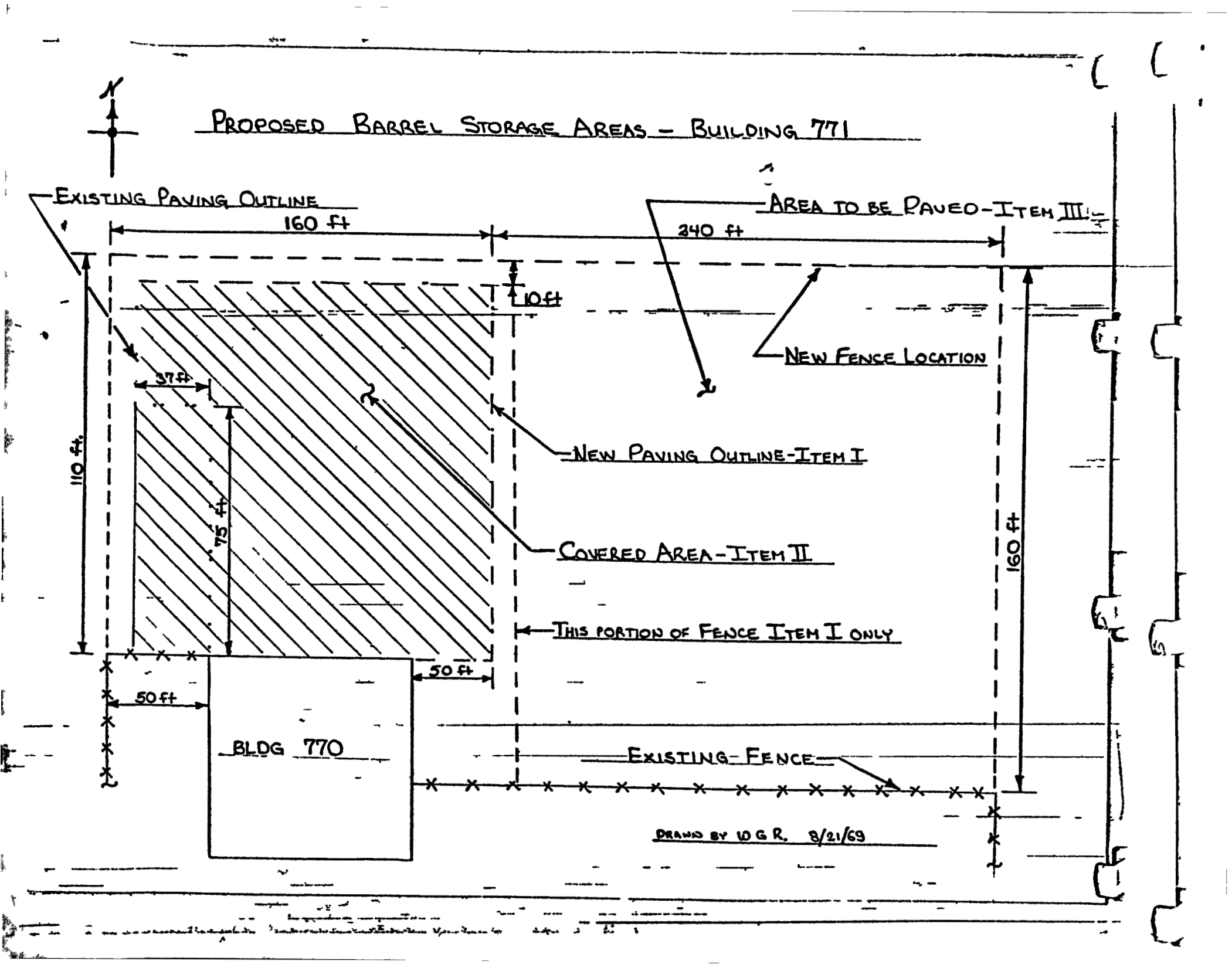
3) SPRINKLER SYSTEM.

150 HEADS × $100/HEAD = 15,000 | 15,000

TOTAL ESTIMATED COST $348,000

15% CONTINGENCY 52,000

GRAND TOTAL ESTIMATED COST $400,000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EXISTING PAVING OUTLINE
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THIS PORTION OF FENCE ITEM I ONLY
50 ft
50 ft
BLDG 770
EXISTING FENCE
DRAWN BY W G R. 8/21/69

7/28

GARY:

PLEASE NOTE THAT THE SUMITTAL FOR THE COVERED STORAGE AREA IS WITHOUT THE BLESSING OR APPROVAL OF THE FIRE PROTECTION ENGINEER. IF HIS INTERPRETATION OF THE A.E.C. MANUAL IS CORRECT, THIS "BUILDING" WILL NEED TO BE DESIGNED TO PROVIDE 2 HR FIRE PROTECTION (WHICH IT DOES NOT NOW DO). THIS WOULD MEAN THAT THE BUILDING WOULD HAVE WALLS ON ALL FOUR SIDES, HEATING & VENTILATION (FILTRATION) ETC., ETC. THIS WOULD DRIVE THE PRICE OF THE BUILDING TO $60.00/ft² OR $900,000 WITHOUT CONTINGENCY, ETC. IF THIS SHOULD COME TO PASS, YOU MIGHT CONSIDER A SMALLER BUILDING

Bill Ross